

DOCKET NO: 262159US0PCT

IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF :  
STEFAN UHRLANDT, ET AL. : EXAMINER: QIAN, Y.  
SERIAL NO: 10/516,308 :  
FILED: DECEMBER 14, 2005 : GROUP ART UNIT: 1793  
FOR: ALUMINUM-CONTAINING :  
PRECIPITATED SILICIC ACID HAVING  
AN ADJUSTABLE BET/CTAB RATIO

APPEAL BRIEF

COMMISSIONER FOR PATENTS  
ALEXANDRIA, VIRGINIA 22313

SIR:

This is an appeal of the Final Rejection dated June 4, 2009 of Claims 1, 2, 6, 7, 16, 17 and 19-23. A Notice of Appeal is **submitted herewith**.

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is Evonik Degussa GmbH, having an address at Rellinghauser Strasse 1-11, 45128 Essen, Germany.

II. RELATED APPEALS AND INTERFERENCES

Appellants, Appellants' legal representative and the assignee are aware of no appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

### III. STATUS OF THE CLAIMS

Claims 1, 2, 6, 7, 16, 17 and 19-23 stand rejected and are herein appealed. Claims 8-15 stand withdrawn from consideration. Claims 3-5 and 18 have been canceled.

### IV. STATUS OF THE AMENDMENTS

No amendment under 37 CFR 1.116 has been filed.

### V. SUMMARY OF THE CLAIMED SUBJECT MATTER

A summary of the claimed subject matter on appeal, as claimed in independent Claim 1, is mapped out below, with reference to page and line numbers in the specification added in **[bold]** after each element.

A precipitated silica comprising **[page 2, line 15]**  
a BET surface area of 150-400 m<sup>2</sup>/g, **[page 2, line 16]**  
a CTAB surface area of 145-350 m<sup>2</sup>/g, **[page 2, lines 17-18]**  
an Al<sub>2</sub>O<sub>3</sub> content of 0.2-5% by weight **[page 2, line 19]** and  
a modified Sears number V<sub>2</sub> of 5-35 ml/(5 g), **[page 3, line 18]** and  
a BET/CTAB surface ratio of from 1.33 to 2.43. **[page 3, lines 12-14]**

### VI. GROUNDS OF REJECTION

#### Ground (A)

Claims 1, 2, 6, 7, 16, 17 and 19-23 stand rejected under 35 USC 103(a) as unpatentable over EP 0983966, by its equivalent US 6,268,424 (Blume et al) in view of US 5,800,608 (Bomal et al).

Ground (B)

Claims 19 and 20 stand rejected under 35 USC 112, second paragraph.

VII. ARGUMENT

Ground (A)

Claims 1, 2, 6, 7, 16, 17 and 19-23 stand rejected under 35 USC 103(a) as unpatentable over Blume et al in view of Bomal et al. That rejection is untenable and should not be sustained.

Independent Claim 1 herein is drawn to a precipitated silica comprising  
a BET surface area of 150-400 m<sup>2</sup>/g,  
a CTAB surface area of 145-350 m<sup>2</sup>/g,  
an Al<sub>2</sub>O<sub>3</sub> content of 0.2-5% by weight,  
a modified Sears number V<sub>2</sub> of 5-35 ml/(5 g), and  
a BET/CTAB surface ratio of from 1.33 to 2.43.

Blume et al is described in the specification herein at page 2, lines 3-8. As described therein, and as can be confirmed in Blume et al, the maximum CTAB surface area of Blume et al's precipitated silica containing alumina is 139 m<sup>2</sup>/g. Blume et al actually prefers a maximum CTAB surface area of 130 m<sup>2</sup>/g (column 2, line 46).

Bomal et al discloses a precipitated silica containing alumina having, *inter alia*, a CTAB surface area of between 140 and 200 m<sup>2</sup>/g and a BET surface area of between 140 and 200 m<sup>2</sup>/g (column 8, lines 11-16). The BET and CTAB surface areas appear to roughly similar numerically. Indeed, Bomal et al disclose very preferably a BET/CTAB surface ratio of between 1.0 and 1.2 (column 8, lines 47-50). Indeed, the exemplified silicas, as shown in Table 1 therein (bottom of columns 15-16) have a BET/CTAB surface ratio within that range.

Bomal et al discloses nothing with regard to the modified Sears number  $V_2$  of their precipitated silica.

The Examiner holds that it would have been obvious to have employed the CTAB of Bomal et al to the precipitated silica of the composition of Blume et al, relying on Bomal et al's disclosure that their precipitated silica has excellent dispersibility and very satisfactory reinforcing properties (Abstract).

In reply, the properties relied on by the Examiner in Bomal et al are disclosed for the precipitated silica *per se*, not because of the CTAB surface area range alone. In addition, such improved dispersibility and reinforcing properties in rubber composition are also a benefit in Blume et al, as confirmed by the data therein for Examples 10 and 11 thereof (column 12, line 30 through column 13, line 37). Indeed, without the present disclosure as a guide, one of ordinary skill in the art would have no motivation to modify the CTAB surface area of Blume et al to be greater than the disclosed maximum therein of  $139 \text{ m}^2/\text{g}$ , especially given the preference therein of a maximum of  $130 \text{ m}^2/\text{g}$ . In addition, even if Bomal et al were combined with Blume et al, the result would still not be the presently-claimed invention since Bomal et al neither discloses nor suggests a BET/CTAB surface ratio as high as the minimum of 1.33 of the above-amended claims. Since the CTAB and BET/CTAB surface ratio values are obviously interrelated, one skilled in the art could not pick one value while ignoring the other.

In the Final Rejection, the Examiner responds to the above arguments by stating that Blume et al discloses Sears numbers and BET/CTAB ratios that, in effect, overlap the corresponding limitations of the present claims; that it is not necessary for Bomal et al to disclose, in effect, all the present claim limitations; and that one cannot show unobviousness by attacking references individually where rejections are based on their combination (citations omitted.)

In reply, the Examiner's rationale is tantamount to holding that if individual claim limitations can together be found in a combination of prior art, then the claim necessarily would have been obvious over this combination of prior art. This is an improper approach. In so doing, the Examiner has clearly picked limitations that support the holding of obviousness while unreasonably ignoring limitations that support a holding of non-obviousness and indeed, demonstrate internal inconsistencies in the holding of obviousness. Thus, the Examiner ignores the fact that Blume et al requires a maximum CTAB surface area of  $139 \text{ m}^2/\text{g}$ , preferably  $130 \text{ m}^2/\text{g}$ . Moreover, to maintain, for example, a BET/CTAB ratio of at least 1.33 (which is the minimum value in the present claims and within the 1.0-1.6 ratio of Blume et al), when the BET surface area in Blume et al is its maximum of  $180 \text{ m}^2/\text{g}$ , then its CTAB surface area would be  $180/1.33$ , or  $135.33 \text{ m}^2/\text{g}$ . to achieve a higher CTAB surface area, the BET/CTAB ratio would have to be less than the presently-recited 1.33 minimum. Obviously, only with such a lower BET/CTAB ratio could one practice Blume et al within their parameters of BET surface area and BET/CTAB ratio, but with a higher CTAB surface area as disclosed by Bomal et al. In other words, if Blume et al and Bomal et al were combined, the resulting BET/CTAB ratio would necessarily be lower than the presently-recited 1.33 minimum.

#### Claims 19 and 20

Claims 19 and 20 are separately patentable because neither Blume et al nor Bomal et al nor their combination discloses or suggests a silica that would be obtained by the particular process recited in Claim 8, since the silica-making processes disclosed in Blume et al and Bomal et al, respectively, are different.

Claim 23

Claim 23 is separately patentable because in addition to the other differences between the present invention and the prior art discussed above, the BET surface area range of this claim is outside the terms of Blume et al, which is 80-180 m<sup>2</sup>/g, and outside the preferred BET surface area of Bomal et al, which is 150-190 m<sup>2</sup>/g (column 8, lines 15-16).

For all the above reasons, it is respectfully requested that this rejection be REVERSED.

Ground (B)

Claims 19-20 stand rejected under 35 U.S.C. § 112, second paragraph. That rejection is untenable and should not be sustained.

The rejection is not understood since the metes and bounds of Claims 19 and 20 are clear. Indeed, Claims 19 and 20 are analogous to Claims 16 and 17, respectively, but depend on Claim 8.

In the Final Rejection, the Examiner states these claims are interpreted as depending on Claim 1 because Claim 8 is a non-elected claim. This interpretation is obviously incorrect. However, it provides evidence that the Examiner's apparent rationale is that the claims are rejectionable only because they depend on a non-elected claim.

In reply, there is no statutory requirement proscribing such claims, since the subject matter of Claim 8 is in the record. Obviously, if the claims were to be found otherwise allowable and Claim 8 not otherwise rejoined and found allowable to, the claims would have to be amended into independent form prior to issue.

While not apparently necessary to decide the issue, Claim 8 is reproduced below for the Board's convenience:

Claim 8 (Withdrawn): A process for preparing a precipitated silica wherein the precipitated silica has a

BET surface area in the range 150-400 m<sup>2</sup>/g,

a CTAB surface area in the range 145-350 m<sup>2</sup>/g, and

an Al<sub>2</sub>O<sub>3</sub> content in the range 0.2-5% by weight comprising,

a) charging an aqueous waterglass solution into a reactor,

b) metering waterglass and sulfuric acid into the reactor simultaneously into this

initial charge at from 55 to 95°C for from 30 to 100 minutes with stirring forming a mixture,

c) acidifying the mixture with sulfuric acid to a pH of about 5 to form a product, and

d) filtering and drying the product,

with the proviso that aluminum compounds are added in steps b) and/or c).

For all the above reasons, it is respectfully requested that this rejection be REVERSED.

#### VIII. CONCLUSION

For the above reasons, it is respectfully requested that the rejections be REVERSED.

Respectfully submitted,

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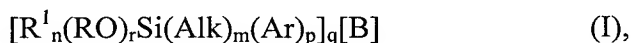
CLAIMS APPENDIX

Claim 1. A precipitated silica comprising  
a BET surface area of 150-400 m<sup>2</sup>/g,  
a CTAB surface area of 145-350 m<sup>2</sup>/g,  
an Al<sub>2</sub>O<sub>3</sub> content of 0.2-5% by weight and  
a modified Sears number V<sub>2</sub> of 5-35 ml/(5 g), and  
a BET/CTAB surface ratio of from 1.33 to 2.43.

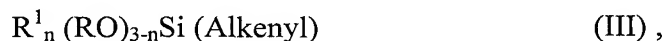
Claim 2. A precipitated silica of claim 1, wherein the precipitated silica has a DBP absorption of from 180 to 320 g/100 g.

Claim 6. A precipitated silica of a claim 1, wherein the precipitated silica has a wk coefficient  $\leq 3.4$ .

Claim 7. A precipitated silica of claim 1, wherein the precipitated silica surface has been modified with an organosilane of the formulae



or



in which

B is -SCN, -SH, -SC(O)CH<sub>3</sub>, -SC(O)(CH<sub>2</sub>)<sub>6</sub>CH<sub>3</sub>, -Cl, -NH<sub>2</sub>, -OC(O)CHCH<sub>2</sub>,  
-OC(O)C(CH<sub>3</sub>)CH<sub>2</sub> (if q = 1), or -S<sub>x</sub>- (if q = 2),

R and R<sup>I</sup> are each an aliphatic, olefinic, aromatic or arylaromatic radical having 2 to 30 carbon atoms, and optionally substituted with the following groups: hydroxyl, amino,



alkoxide, cyanide, thiocyanide, halogen, sulfonic acid, sulfonic ester, thiol, benzoic acid, benzoic ester, carboxylic acid, carboxylic ester, acrylate, methacrylate or organosilane radical, it being possible for R and R<sup>1</sup> to have an identical or different definition or substitution,

n is 0, 1 or 2,

Alk is a divalent unbranched or branched hydrocarbon radical having 1 to 6 carbon atoms, m is 0 or 1,

Ar is an aryl radical having 6 to 12 carbon atoms, which can be substituted by the following groups: hydroxyl, amino, alkoxide, cyanide, thiocyanide, halogen, sulfonic acid, sulfonic ester, thiol, benzoic acid, benzoic ester, carboxylic acid, carboxylic ester or organosilane radical,

p is 0 or 1, with the proviso that p and n are not simultaneously 0,

x is a number from 2 to 8,

r is 1, 2 or 3, with the proviso that  $r + n + m + p = 4$ ,

Alkyl is a monovalent unbranched or branched unsaturated hydrocarbon radical having 1 to 20 carbon atoms, Alkenyl is a monovalent unbranched or branched unsaturated hydrocarbon radical having 2 to 20 carbon atoms.

Claim 16. A vulcanizable rubber mixture or vulcanizate comprising the precipitated silica of claim 1.

Claim 17. A tire comprising a precipitated silica of claim 1.

Claim 19. A vulcanizable rubber mixture or vulcanizate comprising the precipitated silica prepared according to claim 8.

Claim 20. A tire comprising a precipitated silica prepared according to claim 8.

Claim 21. A battery separator, an anti-blocking agent, a flatting agent in a paint, a paper coating, a defoamer, a gasket, a keypad, a conveyor belt or a window seal comprising the precipitated silica as claimed in claim 1.

Claim 22. A precipitated silica of a claim 7, wherein Ar has 6 carbon atoms, Alkyl has 2 to 8 carbon atoms, and Alkenyl has 2 to 8 carbon atoms.

Claim 23. The precipitated silica of claim 1, wherein the BET surface area is 195-400 m<sup>2</sup>/g.

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EVIDENCE APPENDIX

None.

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RELATED PROCEEDINGS APPENDIX

None.